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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,022	06/28/2006	Andrew S. D'Souza	59490US004	5800
32692	7590	03/31/2008		
3M INNOVATIVE PROPERTIES COMPANY PO BOX 33427 ST. PAUL, MN 55133-3427			EXAMINER CHOI, LING SIU	
			ART UNIT 1796	PAPER NUMBER
			NOTIFICATION DATE 03/31/2008	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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### Office Action Summary

**Application No.**

10/585,022

**Applicant(s)**

D'SOUZA, ANDREW S.

**Examiner**

Ling-Siu Choi

**Art Unit**

1796

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 3, 4 and 6-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3, 4 and 6-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SI/88)  
Paper No(s)/Mail Date 02/08/2008
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This Office Action is in response to the Amendment and IDS, both being filed 02/08/2008. Claims 2 and 5 were canceled and claims 1, 3-4, and 6-8 are now pending.

### ***Claim Objections***

2. Claims 1, 3-4, and 6-8 are objected to because of the following informalities: (A) Claim 1, "A filled thermoplastic resin composite comprising at least one thermoplastic olefin, maleic anhydride, and glass bubbles wherein said glass bubbles have been treated with at least one of a silane coupling agent or titanate coupling agent said glass bubbles exhibit a crush strength of at least 3,000 PSI" is suggested to be changed to -- A filled thermoplastic resin composite comprising at least one thermoplastic olefin, maleic anhydride, and glass bubbles\_ wherein said glass bubbles have been treated with at least one of a silane coupling agent or titanate coupling agent and said glass bubbles exhibit a crush strength of at least 3,000 psi --; (B) Claim 3, "The composite of claim 2" is suggested to be changed to --The composite of claim 1--; (C) Claim 4, line 1, "said coupling agent" is suggested to be changed to --said aminosilane--; and (D) Claim 6, line 2, "18,000 PSI" is suggested to be changed to --18,000 psi--.

Appropriate correction is required.

### ***Claim Analysis***

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## 3. Summary of claim 1:

A filled thermoplastic resin composite comprising	
A	at least one thermoplastic olefin
B	<u>maleic anhydride</u>
C	<u>glass bubbles</u>
said glass bubbles have been treated with at least one of a silane coupling agent or titanate coupling agent and	
said glass bubbles exhibit a crush strength of at least 3,000 psi	

key words: glass bubble, glass balloon, hollow microsphere, hollow particle.

***Claim Rejections - 35 USC § 102***

4. **The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:**

**A person shall be entitled to a patent unless –**

**(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.**

5. Claims 1, 3, and 6-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Sobajima et al. (US 5,296,186).

Sobajima et al. disclose a molded product of propylene resin obtained by the steps of (A) melting and mixing **component a** and **component b**; (B) kneading the resulting mixture to prepare a resin composition, and then (C) molding the resin

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composition into a molded product, wherein **component a** is a crystalline propylene polymer including a propylene-ethylene block copolymer which is at least partly modified with an unsaturated organic acid or its derivative such as maleic anhydride and **component b** is a filler in the form of hollow particles including a glass balloon (col. 3, lines 28-33; claims 1-5). Sobajima et al. further disclose that the hollow particles are preferably treated on the surface with a coupling agent including silane and titanate to enhance the hardness of the hollow particles and impact strength, heat resistance, and rigidity of the resulting molded product (col. 3, lines 60-68; col. 4, lines 1-4). Sobajima et al. furthermore disclose that "the coupling-treated glass balloons having .....a mean 10%-by-weight breakage pressure resistance of 200 kg/cm<sup>2</sup> [2845 psi] or more, especially those having.....a mean 10 %-by-weight breakage pressure resistance of 250 kg/cm<sup>2</sup> [3556 psi] or more (col. 4, lines 5-24). Thus, the present claims are anticipated by the disclosure of Sobajima et al.

***Claim Rejections - 35 USC § 103***

6. **The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:**

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sobajima et al. (US 5,296,186) in view of Guillet (EP 0 436 198 A2).

The disclosure of Sobajima et al. is adequately set forth in paragraph 5 and is incorporated herein by reference.

The difference between the present claims and the disclosure of Sobajima et al. is the requirement of the glass bubbles being modified with the specific aminosilane.

Guillet discloses a glass fiber-reinforced composite material obtained by (A) treating **glass** fibers with a aminosilane such as  **$\gamma$ -aminopropyltriethoxysilane** and a vinyl silane and (B) admixing the treated glass fibers with a **polyolefin resin** such as polypropylene (abstract; Claims 1, 7-9, and 20). Guillet further discloses that "[i]n order to obtain optimum performance from covalent fiber bonding agents in the production of polyolefin-based composites, there is a need for a process for pre-treatment of glass fiber which will enhance the ability of the treated fiber to participate in covalent bonding to the polyolefin matrix" [**motivation**] (page 3, lines 13-16). It is noted that the filler is glass fibers instead of glass bubbles. The difference between the glass fiber and the glass bubbles is the shape but not properties. Thus, both glass fibers and glass bubbles would be modified with the aminosilane by the same reaction mechanism. In light of such benefit, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the specific aminosilane or vinylsilane to modify the glass bubbles to enhance the ability of the treated glass bubbles to participate in covalent bonding to the polyolefin matrix and thereby obtain the present invention.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Hase et al. (US 2002/0142175 A1) disclose a resin composition comprising (a) 30-80 parts by weight of a polyolefin thermoplastic elastomer, (b) 1-20 parts by weight of a polypropylene modified with 0.1-10% by weight of maleic anhydride, (c) 5-50 parts by weight of a styrene-based polymeric elastomer, and (d) 10-30 parts by weight of a **propylene polymer** selected from propylene homopolymers and propylene-ethylene copolymers having a propylene content of at least 50% by weight, wherein a total amount of the resin components (a), (b), (c) and (d) is 100 parts by weight; ([0058]; claim 1). However, Hase et al. do not teach or fairly suggest the claimed composition comprising at least one thermoplastic olefin, maleic anhydride, and glass bubbles, wherein the composition comprises a glass bubble which has been treated with at least one of a silane coupling agent or titanate coupling agent and exhibits a crush strength of at least 3,000 psi.

Curzon et al. (US 5,597,522) disclose a composition comprising a polyolefin and a hollow microsphere as a filler, wherein the microspheres are glass bubbles (abstract; col. 3, lines 7-11). Curzon et al. further disclose that "it is possible to compound "glass bubbles" with, inter alia, polypropylene using extrusion equipment, with less than 5% by weight breakage to produce low-density composite materials. Proposed uses thereof are extruded parts for buoyant and thermal insulation and large

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automotive moldings" (col. 1, lines 28-35). However, Curzon et al. do not teach or fairly suggest the claimed resin composition comprising at least one thermoplastic olefin, maleic anhydride, and glass bubbles, wherein the composition comprises a glass bubble which has been treated with at least one of a silane coupling agent or titanate coupling agent and exhibits a crush strength of at least 3,000 psi.

Beck (US 3,365,315) discloses a composite comprising a resin and a glass bubbles, wherein the glass bubbles has a high strength and the use of the glass bubbles would result in the composite having a very low density but high strength (col. 2, lines 23-28). Beck further disclose that the glass bubbles "had an average true particle density of 0.42. They were placed in mineral oil and the oil subjected to 12,000 p.s.i. Only 28 % of the bubbles were crushed by this treatment, indicating a surprisingly high resistance to crushing" (col. 7, lines 7-13). However, Beck does not teach or fairly suggest the claimed resin composition comprising at least one thermoplastic olefin, maleic anhydride, and glass bubbles, wherein the composition comprises a glass bubble which has been treated with at least one of a silane coupling agent or titanate coupling agent and exhibits a crush strength of at least 3,000 psi.

9. Applicant's submission of an information disclosure statement under 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p) on 02/08/2008 prompted the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 609.04(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).



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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on 571-272-1114.

/Ling-Siu Choi/

Primary Examiner, Art Unit 1796

March 18, 2008

